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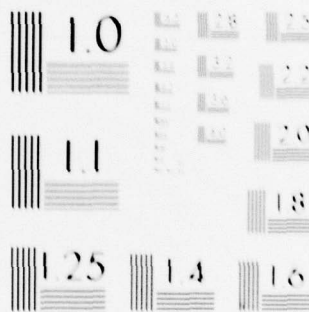   AUG 79   W E CORY   DAAG29-79-C-0047
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COMPUTER SYSTEMS LABORATORY

STANFORD ELECTRONICS LABORATORIES
DEPARTMENT OF ELECTRICAL ENGINEERING
STANFORD UNIVERSITY · STANFORD, CA 94305

SYNDIA USER'S GUIDE

by

W.E. Cory

Technical Report No. 176

August 1979

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ABSTRACT

This report describes how to use the Syndia/Syngra
system available at SU-SCORE. This system accepts a
BNF-like grammar specification and automatically generates
syntax diagrams on a Tektronix graphics terminal. Syndia is
the major component of this system; Syngra acts as an
interface between Syndia and the SUDS2 graphics editor.
Syndia performs no ambiguity or consistency checks on the
BNF input.

This report assumes that the reader is familiar with
BNF and syntax diagram representations of grammars.

INDEX TERMS: Syndia, automatic syntax diagram generation,
               BNF, Backus-Naur Form, language documentation

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1.0   INTRODUCTION

Syndia is a Pascal program which reads a modified-BNF description and writes instructions for drawing syntax diagrams on a hypothetical plotter. One drawing is generated for each BNF production.

Syndia is now available at SU-SCORE and is interfaced to the SCORE graphics editor SUDS2 by a second program Syngra. This manual describes the use of Syndia and Syngra along with the input format required by Syndia.

Syndia was originally written by J. Spillman and was modified and extended by Karl Josef Bucher at Eidg. Techische Hochschule in Zuerich. Larry Paulson (Stanford SAIL) modified Syndia to run under TOPS-10. Warren Cory made further modifications and has set up the current working version on SU-SCORE.

This manual (minus diagrams) is on-line at SU-SCORE in DOC:SYNDIA.MAN. The original Syndia files for all the examples in this manual are
            PS:<CSL.DA.SYNDIA>SME1,
            PS:<CSL.DA.SYNDIA>SME2,
            PS:<CSL.DA.SYNDIA>SME3, and
            PS:<CSL.DA.SYNDIA>SYNDIA.SYN.

2.0 OVERVIEW

BNF INPUT
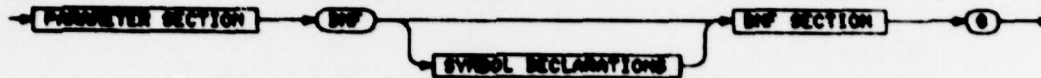
A Syndia BNF description contains three major sections. The first is the parameter section. In this section, the user specifies what output should be generated, the width of the plots, etc.

The second section, the symbol declaration section, is optional. Here the user may define the character string values of identifiers. This is useful for two reasons:

1. The user may define short abbreviations for long character strings.

2. The character string value is always treated as an identifier, even if it contains meta-characters or keywords. This will be explained in more detail later.

The final section contains the BNF productions. This section may also include modifications which affect the layout of individual diagrams.

These three sections are described in turn in Sections 4, 5, and 6, following a discussion of identifiers and constants in Section 3. The use of Syndia and Syngra is explained in Section 7. Finally, a complete example appears in Section 8.

3.0 SYNDIA CHARACTER SET, IDENTIFIERS, AND CONSTANTS

3.1 Character Set

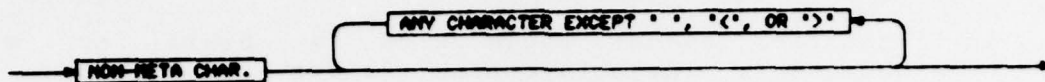Syndia uses the following character set:

```
Upper case letters      A-Z
Digits                  0-9
Special characters      ! " # $ % & ' ( ) *
                        + , - . / : ; < > =
                        ? @ [ ] \ ^ _
Blank
```

The remaining printing 7-bit ASCII characters are "folded"
(upper-cased) on input according to the table below. Hence,
Syndia will not recognize the characters "`", "{", "}", "|",
or "~", and these characters should not appear in the input.
Syndia will expand tabs (CTRL-I) to blanks; other
non-printing characters are ignored.

```
          ASCII CHARACTERS:                 "FOLDED" TO:
     Lower case letters   a-z    Upper case letters   A-Z
                 `                            @
                 {                            [
                 }                            ]
                 |                            \
                 ~                            ^
     DEL (ASCII code 177 octal)               _
```
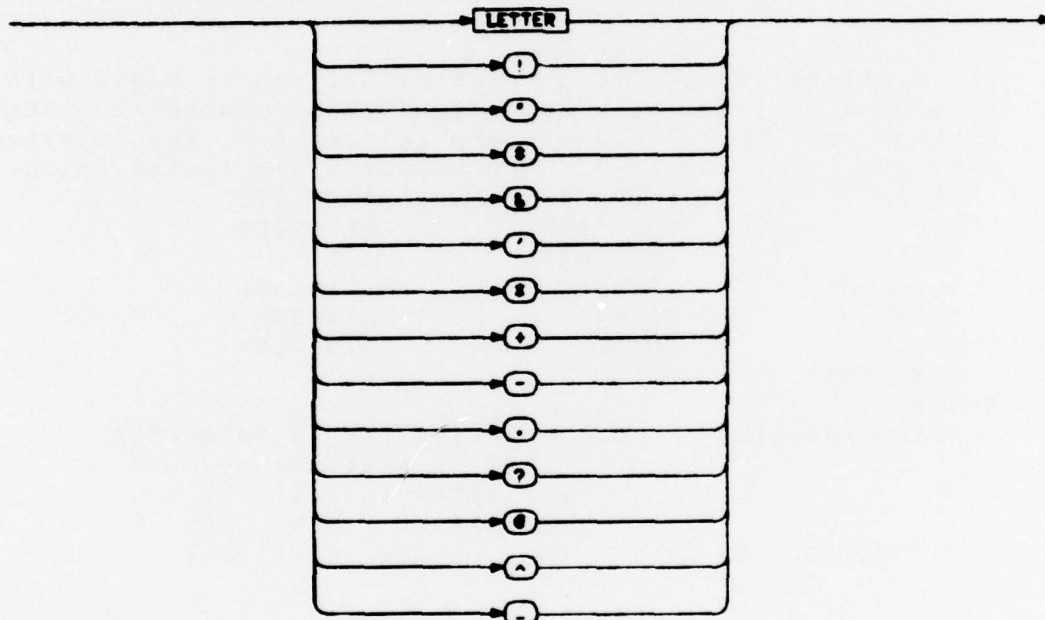
3.2 Identifiers

IDENTIFIER

NON-META CHAR.

Identifiers in Syndia are used as names for character strings. The syntax for identifiers in Syndia is more flexible than in most languages, as the following examples show:

```
VALID IDENTIFIERS:
 **STAR**
 .+1
 EXPRESSION
 #
 META$%(),/:;=[ ]\
```

The following restrictions apply to identifier names:

1. Identifiers longer than 40 characters are truncated to 40 characters.

2. Blanks cannot be embedded in identifiers.

3. Identifiers cannot contain the characters "<" or ">".
    Example:
       TERM>   is equivalent to   TERM >   ;
                          that is, ">" is not part of the
                          identifier.

4. An identifier cannot begin with a digit or a
    meta-character. The meta-characters are listed below:
       < > / = : , ; % $ \ [ ] ( )
    Example:
       [BOX]   is equivalent to   [BOX]   ;
                          "[" is not part of the identifier
                          (but "]" is!).

5. An identifier cannot be a keyword, nor can it begin with
    a keyword followed by a non-alphanumeric character. The
    alphanumeric characters are the letters A-Z, the digits
    0-9, and underscore "_". The keywords are listed below:

       APPEND   ENDMODIFY   PAGEWIDTH
       BNF   ENDPARAM   PARAMETER
       BREAK   EXCHANGE   PLOT
       BREAKOPT   LABELS   PLOTLABEL
       CHARS   MAIN   PRINTBNF
       CM   MODIFY   PRINTPLOT
       DIANUMBER   OZERO   SYM
    Example:
   PARAMETER-LIST   is equivalent to PARAMETER
                                   -LIST ; that is, keyword
                                   PARAMETER followed by
                                   identifier -LIST. But
       PARAMETER_LIST   is a single identifier.

    Note that meta-characters (except "<" and ">") which
follow an identifier but are not intended to be part of the
identifier name MUST BE SEPARATED FROM THE IDENTIFIER BY
SPACE OR END-OF-LINE. Also, the string "PLOT(15.0)" is not
an identifier (since PLOT is a keyword); it is equivalent
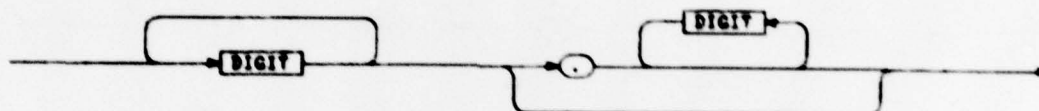to "PLOT (15 . 0)".

    Blanks may not be embedded in keywords.
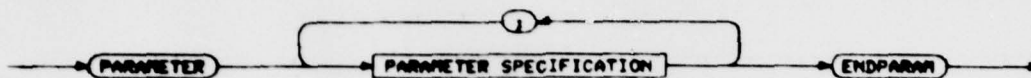
3.3 Constants

INTEGER
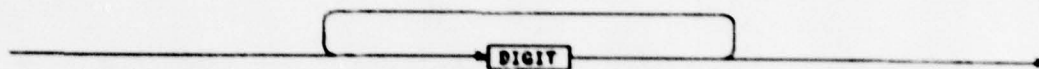
NUMBER

In Syndia, constants are unsigned integers or fixed point real numbers. In real numbers, at least one digit must precede the decimal point. Blanks may not be embedded in numbers.
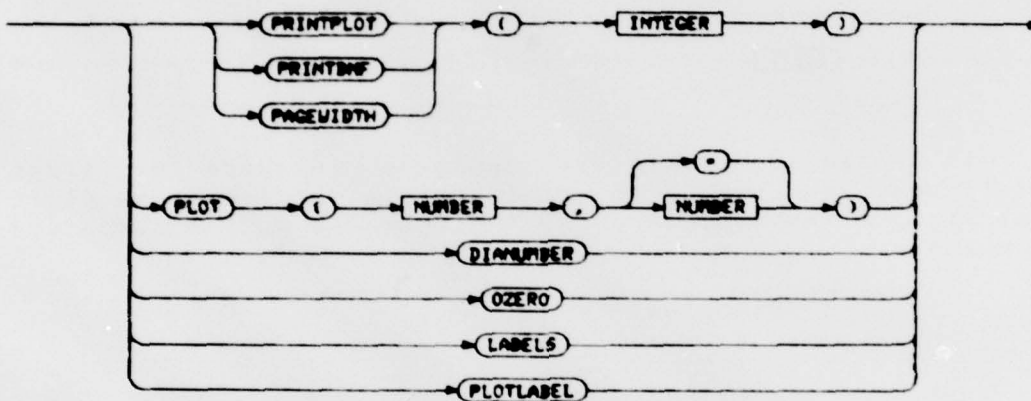
Examples:
0
1.7
0.1683
22001
2.

4.0 PARAMETER SECTION

PARAMETER SECTION

PARAMETER SPECIFICATION

Syndia generates two output files: a lineprinter listing showing the input with other optional output, and a second file containing instructions for the hypothetical plotter. In the parameter section, the user may specify up to eight parameters which indicate the nature of this output. These are discussed in turn:

4.1 PRINTPLOT

PRINTPLOT specifies that the lineprinter listing include plots of the several diagrams, drawn with standard ASCII characters for output on an ordinary lineprinter. This is useful if it is inconvenient to obtain plotter drawings every time Syndia is run during the BNF debugging process. The integer argument specifies the default width in columns to be used for the plots. (If this default value is too small for some diagram, then the smallest possible width will be used.)

4.2 PRINTBNF

PRINTBNF specifies that Syndia include in the listing
the final BNF resulting after any symbol substitutions have
been carried out. The integer argument gives the width in
columns of the BNF listing.   Syndia makes no attempt to
"pretty print" this listing.

4.3 PAGEWIDTH

PAGEWIDTH gives the width in columns of the page on
which the listing is to be printed. The number given does
not include the first column, which Syndia always sets to
blank ' ' for Fortran carriage control. When no PAGEWIDTH
parameter is present, a page width of 130 is assumed.

Syndia will allow the widths given with PRINTPLOT and
PRINTBNF to exceed the page width. In such cases, Syndia
will split the output at the page boundary.

4.4 PLOT

The PLOT parameter specifies that instructions for the
hypothetical plotter be output. The first number argument
gives the default width in centimeters for the syntax
diagrams.   (15 cm.   is just under 6 inches.) The second
argument gives the width of the characters to be used in the
diagrams.   Syndia will NOT check to ensure that the
character size specified is not too big.

The plotter drawings will be scaled to resemble the
lineprinter drawings obtained by PRINTPLOT. If PRINTPLOT is
not specified, the plotter drawings will resemble
lineprinter plots 100 columns wide.

There are two possible special values for the second
argument.   If the second argument is zero, then Syndia will
compute the largest character size it can use for each
drawing.

The other possible special value for the second
argument is equals-sign "=". This value causes Syndia to
use the same character size used in the lineprinter plots,
scaled by the difference in sizes between the lineprinter
and plotter drawings. This character size will be somewhat
smaller than the size computed if the second argument is
zero.

NOTE The current version of the graphics editor
at SCORE handles only a single character size, 0.1683 cm.
Syndia will automatically select this size unless it is

forced (by excessive drawing density) to choose a smaller size. It is therefore recommended that the user set the second PLOT argument to zero (or, perhaps, to 0.1683).

4.5 DIANUMBER

A diagram generated by Syndia is ordinarily labeled only with the nonterminal name from the left hand side of the corresponding production. If DIANUMBER is specified, then Syndia will precede this label with the integer preceding the production in the BNF section (see Section 6).

4.6 OZERO

If OZERO is specified, then Syndia will change all O's ("oh") to 0's ("zero") and vice versa in the lineprinter and plotter drawings. This is useful, for example, if the plotting software slashes O's ("oh") while the user wants to slash 0's ("zero").

4.7 LABELS

In its internal representation, each syntax diagram has all of its nodes numbered, where a node is a corner or intersection. The user may refer to these node numbers in modifications to alter the layout of the diagram. LABELS specifies that these node numbers will appear in the lineprinter drawings generated by PRINTPLOT.
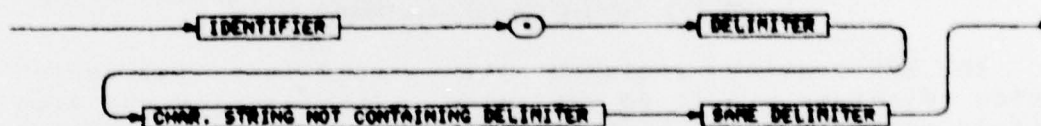
4.8 PLOTLABEL

PLOTLABEL specifies that the node numbers mentioned above will appear in the plotter drawings generated by PLOT.

5.0   SYMBOL DECLARATIONS

SYMBOL DECLARATIONS
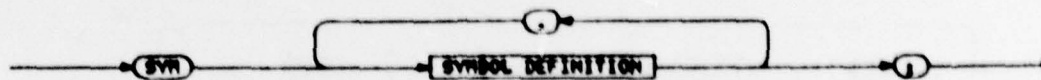
SYMBOL DEFINITION

DELIMITER

Normally, the value of an identifier is the same as its name. For example, the identifier REGISTER has as its value the character string 'REGISTER'. However, identifiers may be assigned different values in the symbol declaration section. When these identifiers appear later in the BNF, they are replaced by their values, the character strings given in the declarations. The replacement strings are always treated as identifiers, even if they contain embedded blanks, meta-characters, or keywords. String replacement is not recursive; for example, after

            B = 'C',
            A = 'B',

the value of A is 'B', not 'C'. Note that any printing character may be used as the delimiter. The replacement string, like all identifiers, must not exceed 40 characters in length.
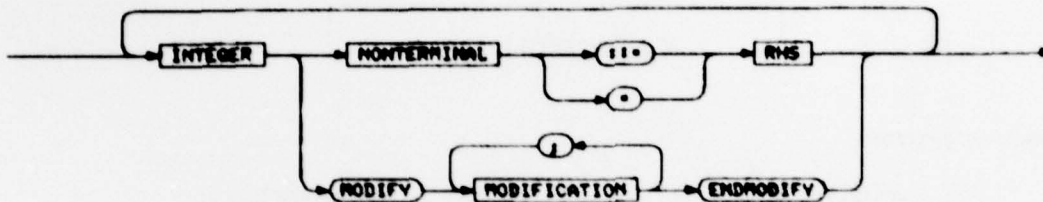
                  Examples:
        SYM L(= '(',   R) = ')',
             P% = '%',   C, = ',',
             SHORT = /LONGER CHARACTER STRING/;

6.0   BNF SECTION

BNF SECTION

The BNF section contains the productions for which syntax diagrams are to be generated. This section may also contain modifications which alter the layout of specified diagrams. Productions and modifications may be mixed in any order.

Syndia draws one syntax diagram per production. It performs absolutely no checking to ensure that the grammar being described makes any sense; the sole function of Syndia is to draw the diagrams specified, nonsensical or not.

The integer preceding each production appears before the label in the syntax diagram if the DIANUMBER parameter is given. In addition, the integers serve as "handles" for the modifications. All modifications preceded by a given integer are applied to all productions preceded by the same number. (The same number may precede several productions.) Note that the integer in front of a production or modification marks the end of the preceding production.

6.1 Productions

RHS
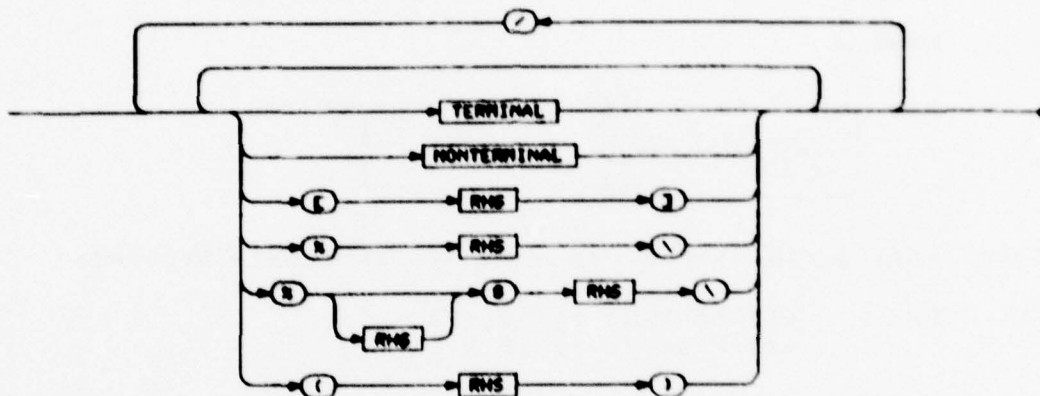
NONTERMINAL
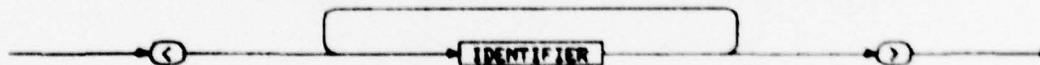
TERMINAL

Syndia production syntax is quite similar to normal BNF. Syndia has special notation for *-closure, +-closure, and lists, which allows the efficient generation of aesthetic diagrams. The syntax is illustrated by examples below in which Syndia's notation is contrasted with standard BNF.

In the simplest production, the right-hand side is a non-empty sequence of terminals and/or nonterminals. The left- and right-hand sides may be separated either by "::=" or by "=":

          <EXAMPLE_1> ::= B <C> <D E> *STAR

EXAMPLE_1

Note the different shapes of the boxes for terminals and nonterminals. Multiple productions for the same nonterminal may be written as a single production with the several alternatives separated by slashes:

BNF: <EXAMPLE_2> ::= B
            <EXAMPLE_2> ::= <C> + <D>
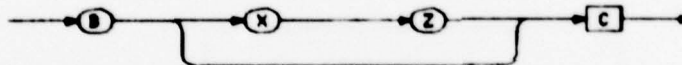   <EXAMPLE_2> ::= XYZ

Syndia: <EXAMPLE_2> ::= B / <C> + <D> / XYZ

EXAMPLE_2

Optional strings in Syndia are enclosed in square brackets:

BNF: <EXAMPLE_3> ::= B <C>
            <EXAMPLE_3> ::= B X Z <C>

Syndia: <EXAMPLE_3> ::= B [X Z] <C>

EXAMPLE_3

Plus-closure is denoted by enclosing text in "%" and "\":
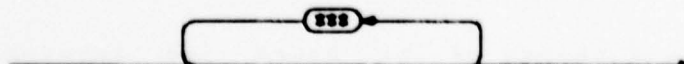
BNF: <EXAMPLE_4> ::= Q
            <EXAMPLE_4> ::= <EXAMPLE_4> Q

Syndia: <EXAMPLE_4> ::= % Q \

EXAMPLE_4

Star-closure is indicated by adding a "$" to the above notation:

BNF: <EXAMPLE_5> ::= null
            <EXAMPLE_5> ::= <EXAMPLE_5> ***

Syndia: <EXAMPLE_5> ::= % $ *** \

EXAMPLE_5

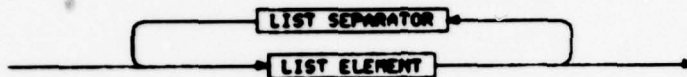

Finally, Syndia has a special list notation which may be regarded as an extension of *-closure:

BNF: <EXAMPLE_6> ::= <LIST ELEMENT>
              <EXAMPLE_6> ::= <EXAMPLE_6> <LIST SEPARATOR>
                                          <LIST ELEMENT>

Syndia: <EXAMPLE_6> ::= % <LIST ELEMENT> $
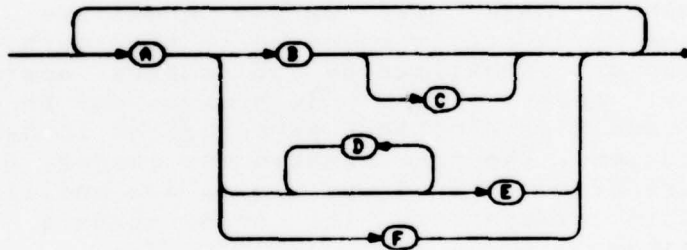   <LIST SEPARATOR> \

EXAMPLE_6

The above constructs may be combined and nested to any
degree, with parentheses used where necessary to achieve the
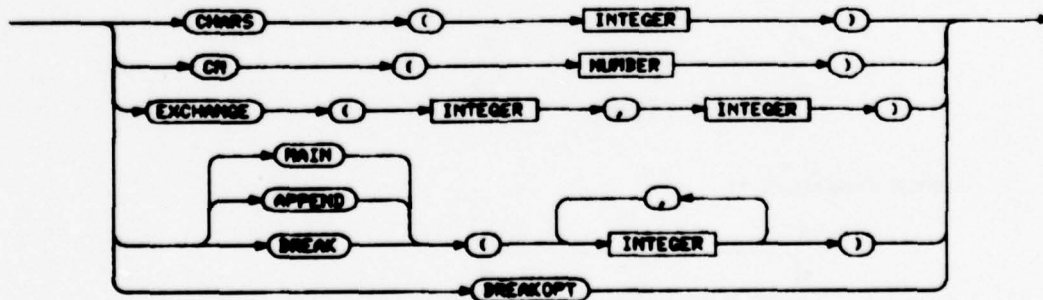proper grouping:

       <EXAMPLE_7> ::= % A (B [C] / % $ D \ E / F) \

EXAMPLE_7

6.2 Modifications

MODIFICATION

       Seven different modifications   are   available   for
altering the appearance of a diagram.

CHARS

The CHARS modifier sets the width in columns of the lineprinter drawing for the associated production(s). If CHARS is not specified, then Syndia will use the default width given with PRINTPLOT (or 100 if PRINTPLOT was not specified). Recall from Section 4 that the width chosen for the lineprinter drawing can affect the appearance of the plotter drawing.

CM

The CM modifier sets the width in centimeters of the plotter drawings for the associated production(s). If CM is not specified, then Syndia will use the default width given with PLOT.

EXCHANGE, MAIN, and APPEND

The EXCHANGE, MAIN, and APPEND modifiers specify horizontal paths which are to be moved in some fashion. The horizontal paths are identified by the numbers assigned to their left-most nodes. These node numbers may be obtained by specifying LABELS or PLOTLABEL as described in Section 4. After modifications, the node numbers may change, but these new node numbers are NOT valid for use in new modifications. The user should always use the node numbers from the unmodified diagram.

The EXCHANGE modifier identifies two horizontal paths which are to be interchanged.

BEFORE EXCHANGE(3,7)
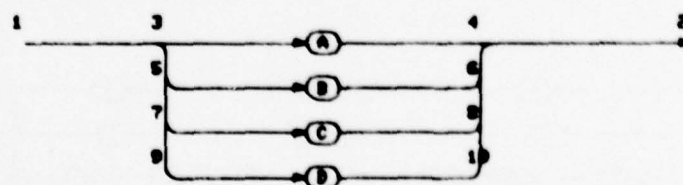
AFTER EXCHANGE(3,7)
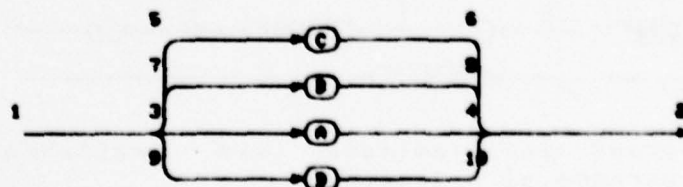
The MAIN modifier specifies a horizontal path which is
to be drawn in line with the entry and exit lines at the end
branch points.

BEFORE MAIN(5)

AFTER MAIN(5)
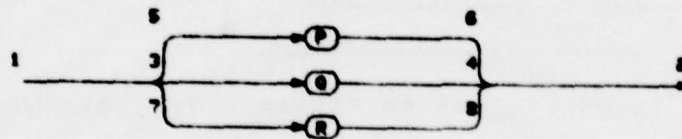
"MAIN(p1,....,pk)" is equivalent to "MAIN(p1);...;MAIN(pk)".

The APPEND modifier specifies a horizontal path which
is to be drawn in line with the horizontal path above it.

BEFORE APPEND(5)
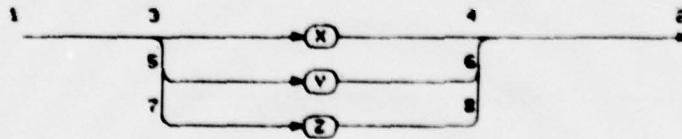
AFTER APPEND(5)
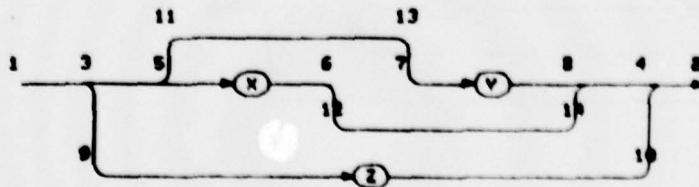
"APPEND(p1,...,pk)"   is   equivalent   to
"APPEND(p1);..;APPEND(pk)".

BREAK

The BREAK modifier identifies a node where a single
horizontal path should be broken into two levels. The node
numbers should always be taken from the unmodified drawing.

BEFORE BREAK(4)
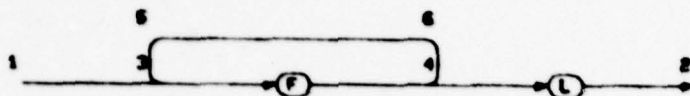
AFTER BREAK(4)
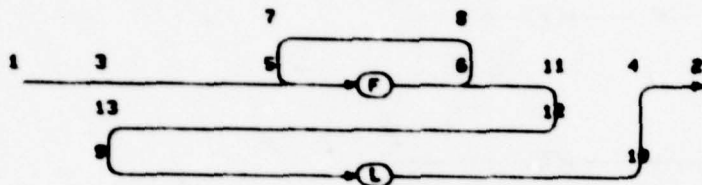
"BREAK(p1,...,pk)" is equivalent to "BREAK(p1);..;BREAK(pk)".

BREAKOPT

The BREAKOPT modifier causes Syndia to automatically insert BREAK's where required to make the lineprinter diagram fit in the width specified in PRINTPLOT (or 100 columns if PRINTPLOT was not specified).

BEFORE BREAKOPT

AFTER BREAKOPT
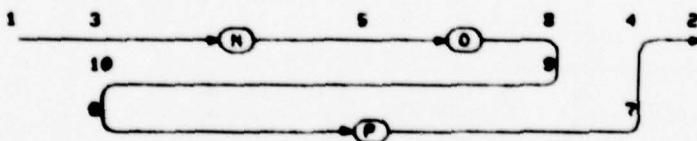
7.0 HOW TO USE SYNDIA

Any file name used by Syndia, Syngra, or the graphics editor must be a valid TOPS-10 file specification in which the name has not more than six characters and the extension has not more than three characters. A TOPS-10 device spec may precede the name, and a directory spec, if present, must be in the form of a PPN following the extension. (The PPN for a directory may be found by the TRANSLATE command.) Hence, in its most general form, a valid file specification has the format

        dev:name.ext[ppn]   .

The procedure for running Syndia at SU-SCORE follows:

1. Prepare your Syndia input file.

2. Give the EXEC command to run Syndia:
        @SYNDIA

3. Syndia will prompt for INPUT, OUTPUT, and MAINPLOT file names. The INPUT file is the file prepared in Step 1. The OUTPUT and MAINPLOT files will contain the lineprinter listing and the hypothetical-plotter instructions, respectively.

    If you follow any file name in this step with "/SYNGRA", as in
        INPUT   = SYNTAX.IN/SYNGRA   ,
    then Syndia will automatically start Syngra if no errors are found in the input. If the input contains errors, Syndia will print a message "ERROR(S) IN INPUT" at the terminal. The error messages may then be found in the OUTPUT listing file.

4. If you did not specify "/SYNGRA" when you ran Syndia, then you may start Syngra by giving the EXEC command:
        @SYNGRA

5. Syngra will prompt for the MAINPLOT file name. Respond with the same MAINPLOT file name you gave Syndia. If you follow this file name with "/EDIT", then Syngra will automatically start the graphics editor when it is done.

6. The function of Syngra is to convert the MAINPLOT output from Syndia into a form readable by the graphics editor. In general Syngra will generate many output files. Each output file corresponds to one screenful of diagrams on the Tektronix 4014. Syngra automatically puts as many diagrams as it can in one screenful; conversely, if one diagram is too big to fit on the screen, Syngra will split it into as many parts as necessary, with enough overlap between parts to allow easy cut-and-paste.

    During execution, Syngra will do three things at the

terminal.

1. Syngra will print the sequence number and name of
    each diagram as it is encountered in the input.

2. Syngra will prompt for output file names as
    required. When choosing the output file names,
    remember that the graphics editor will be expecting
    input files with the extension ".INT" or ".SYM".

3. Syngra will flag the appearance of character sizes
    not supported by the graphics editor. If you
    specified a character width of zero in the PLOT
    parameter, then this error condition indicates a
    diagram that is too crowded. This may be corrected
    by adding modifications, splitting the production
    into several shorter productions, increasing the
    plotter diagram width, or (in some cases) by
    DECREASING the lineprinter diagram width.

7. You must be logged in at the Tektronix 4014 terminal in
    order to run the graphics editor. If you did not
    specify "/EDIT" when you ran Syngra, then you may start
    the editor by giving the EXEC command:
            @SUDS2
    The use of the editor is described in a manual in the
    ERL terminal room next to the 4014 terminal. The manual
    is also on-line at SU-SCORE in DOC:SUDS2.MAN. The use
    of a small subset of the available commands will suffice
    to generate the diagrams.

8.0   EXAMPLE FROM ZUERICH SHOWING USE OF SYNDIA AT SU-SCORE

```
@;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
@;
@;   TYPE OUT THE INPUT FILE
@;
@;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
@;
@TYPE PS:<CSL.DA.SYNDIA>SME3
PARAMETER
    PRINTPLOT(50);
    PLOT(10,0);
    PAGEWIDTH(50);
    LABELS;
    PRINTBNF(50);
    OZERO
ENDPARAM

BNF
SYM
    A1 = /    /, L( = /(/, R) = /)/, SLASH = ./.;
1 < T1 > ::= % B$ C \
1 < T2 > ::= % B $ C \
20 < T3 > ::= [ < A1 > % L( C R) \ ]
1 MODIFY CHARS(40) ENDMODIFY
3 MODIFY APPEND(5) ENDMODIFY
3 <T3 A1 L( T5 R)> = A / B / C
5 <T6> ::= < A > SLASH <B> SLASH/
3 MODIFY MAIN(7) ENDMODIFY
0
@;
@;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
@;
@;    GET PS:<CSL.DA.SYNDIA> PPN
@;
@;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
@;
@TRANSLATE PS:<CSL.DA.SYNDIA>
PS:<CSL.DA.SYNDIA> (IS) PS:[4,1007]
@;
```

```
@;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
@;
@;    NOW RUN SYNDIA AND SYNGRA
@;
@;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
@;
@SYNDIA
INPUT     = PS:SME3[4,1007]/SYNGRA
OUTPUT    = SME3.LIS
MAINPLOT  = SME3.SYO
**STARTING SYNGRA**
MAINPLOT  = SME3.SYO
NEW OUTPUT FILE STARTING IN DIAGRAM  1:
OUTPUTFILE= SME3.INT
STARTING DIAGRAM NO.   1:   T1
STARTING DIAGRAM NO.   2:   T2
STARTING DIAGRAM NO.   3:   T3
STARTING DIAGRAM NO.   4:   T3      ( T5 )
STARTING DIAGRAM NO.   5:   T6

EXIT
@;
@;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
@;
@;    LOOK AT THE OUTPUT LISTING
@;
@;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
@;
@TYPE SME3.LIS
 SYNDIA VERSION JUNE 4, 1979 / SU-SCORE

  PARAMETER
     PRINTPLOT(50);
     PLOT(10,0);
     PAGEWIDTH(50);
     LABELS;
     PRINTBNF(50);
     OZERO
  ENDPARAM



  BNF
  SYM
     A1 = /   /, L( = /(/, R) = /)/, SLASH = ./.;
  1 < T1 > ::= % B$ C \
  1 < T2 > ::= % B $ C \
  20 < T3 > ::= [ < A1 > % L( C R) \ ]
  1 MODIFY CHARS(40) ENDMODIFY
  3 MODIFY APPEND(5) ENDMODIFY
  3 <T3 A1 L( T5 R)> = A / B / C
  5 <T6> ::= < A > SLASH <B> SLASH/
  3 MODIFY MAIN(7) ENDMODIFY
  0
```

TABLE OF ABBREVIATIONS

```
A1                                                    <-- '   '
L(                                                    <-- '('
R)                                                    <-- ')'
SLASH                                                 <-- '/'
```

BACKUS - NAUR - FORM

```
    1   < T1 >   ::=   % 'B$' 'C' \
    2   < T2 >   ::=   % 'B' $ 'C' \
    3   < T3 >   ::=   [ <      > % '(' 'C' ')' \ ]
    4   < T3     ( T5 ) >   ::=   'A' / 'B' / 'C'
    5   < T6 >   ::=   < A > '/' < B > 'SLASH/'
```

END OF BACKUS-NAUR-FORM

T1

```
        5                           6
        -<--------------------------
        I                           A
        V                           I
1       3        --    7      -     4           2
--------I----*B$*----------*C*--------------
        --                  -
```

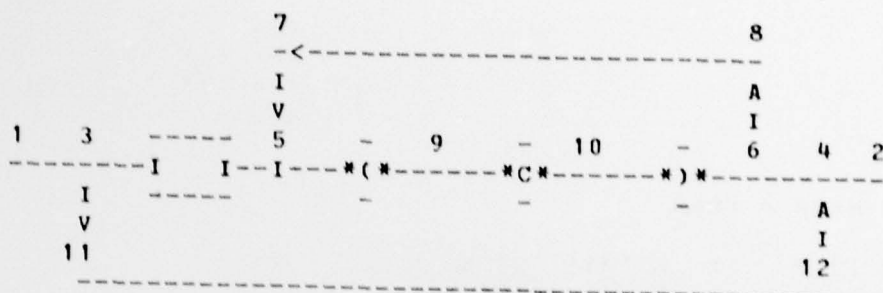T2

```
        5           -       6
        -<------*C*--------
        I           -       A
        V                   I
1       3           -       4               2
-----------I-------*B*-------I-------------
        -
```
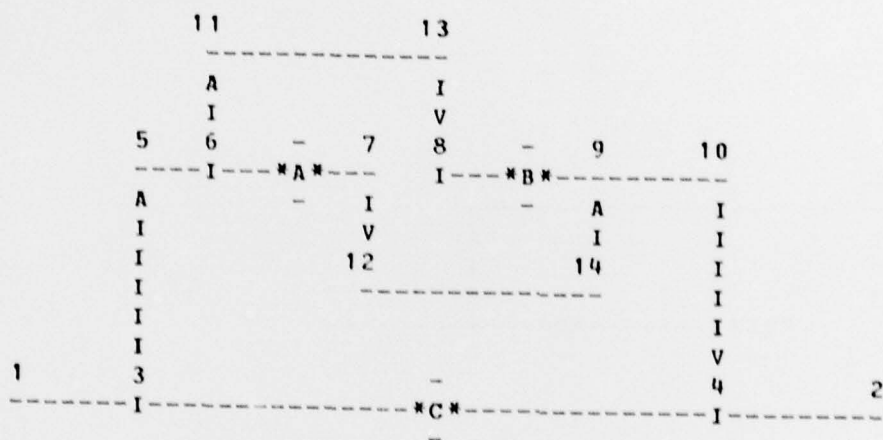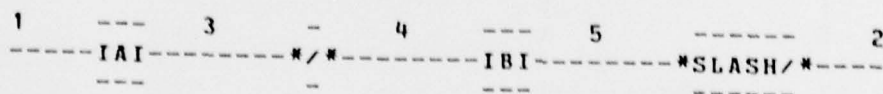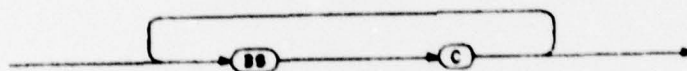
T3

```
                         7                                    8
                       -<- - - - - - - - - - - - - - - - - - -
                         I                                    A
                         V                                    I
  1     3    - - - - -   5    -     9    -    10    -         6     4    2
- - - - - - - -I     I - -I - - -*(*- - - - -*C*- - - - - *)*- - - - - - -
         I       - - - - -           -           -           A
         V                                                   I
       11                                                   12
         - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

T3   (T5)

```
                    11                  13
                     - - - - - - - - - - -
                     A                  I
                     I                  V
            5        6    -     7    8   -    9          10
             - - - -I - - -*A*- - - -I - - -*B*- - - - -
            A            -           I           -    A        I
            I                        V                I        I
            I                       12                14       I
            I                        - - - - - - - - - -        I
            I                                                  I
            I                                                  V
  1         3                                                  4          2
 - - - - - -I - - - - - - - - - - - -*C*- - - - - - - - - - - -I - - - - - -
            -                        -                        -
```

T6

```
  1     - - -     3     -     4    - - -     5      - - - - -     2
- - - - -I A I- - - - - - -*/*- - - - - - -I B I- - - - - -*SLASH/*- - -
    - - -             -             - - -             - - - - -
```

```
@;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
@;
@;    PLOTTER DIAGRAMS MAY NOW BE OBTAINED
@;       BY RUNNING SUDS2 .
@;
@;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
```
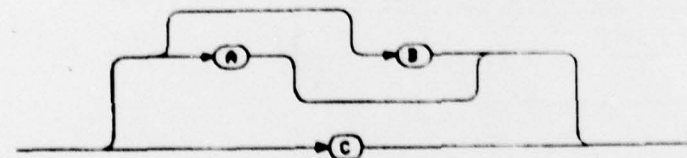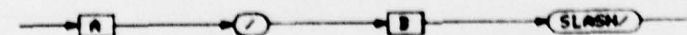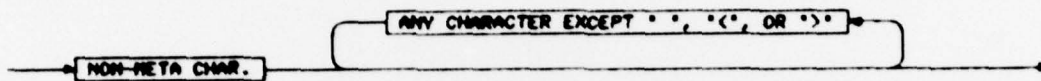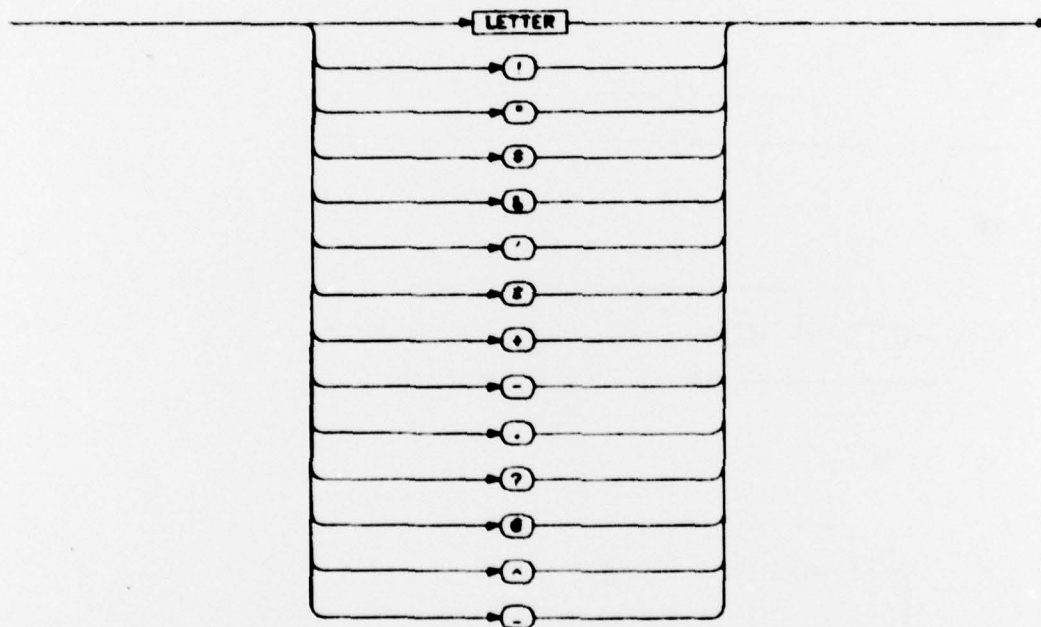
T1

T2

T3
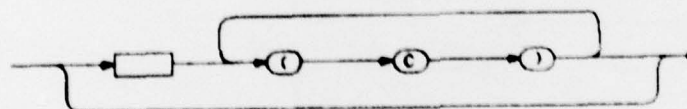
T3   (T5)

T6

9.0   SYNDIA SYNTAX DIAGRAMS

The Syntax diagrams for Syndia are repeated here for reference.

IDENTIFIER

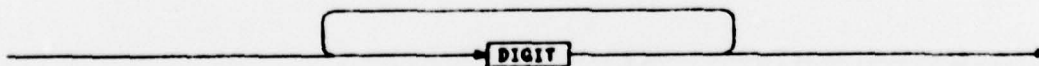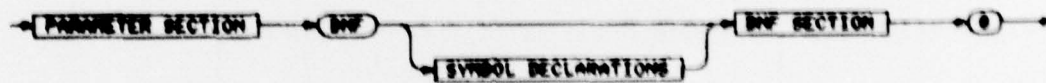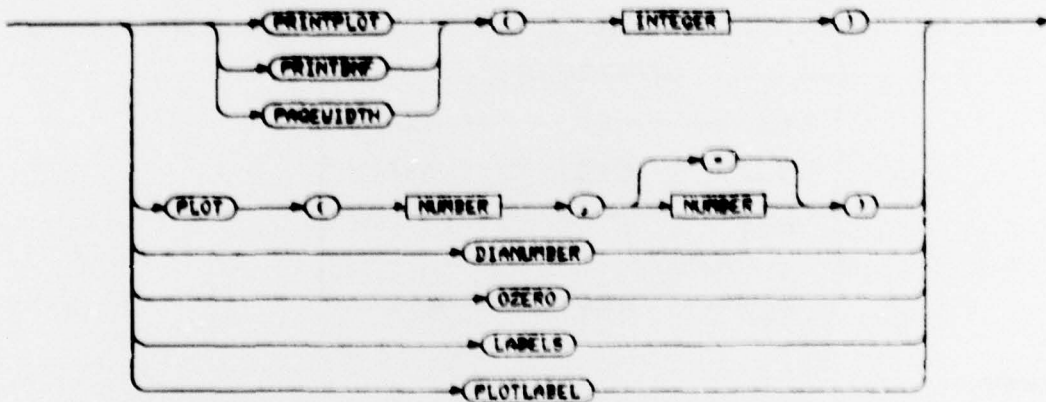**NON-META CHAR.**

INTEGER

NUMBER

BNF INPUT

[PARAMETER SECTION] → [BNF] → [SYMBOL DECLARATIONS] → [BNF SECTION] → (0)

PARAMETER SECTION

(PARAMETER) → [PARAMETER SPECIFICATION] → (ENDPARAM)

PARAMETER SPECIFICATION

(PRINTPLOT) / (PRINTBNF) / (PAGEWIDTH) → (( ) → [INTEGER] → ( ))

(PLOT) → (( ) → [NUMBER] → (,) → [NUMBER] → ( ))
(DIANUMBER)
(OZERO)
(LABELS)
(PLOTLABEL)

SYMBOL DECLARATIONS

(SYM) → [SYMBOL DEFINITION] → (;)

SYMBOL DEFINITION

[IDENTIFIER] → (.) → [DELIMITER]
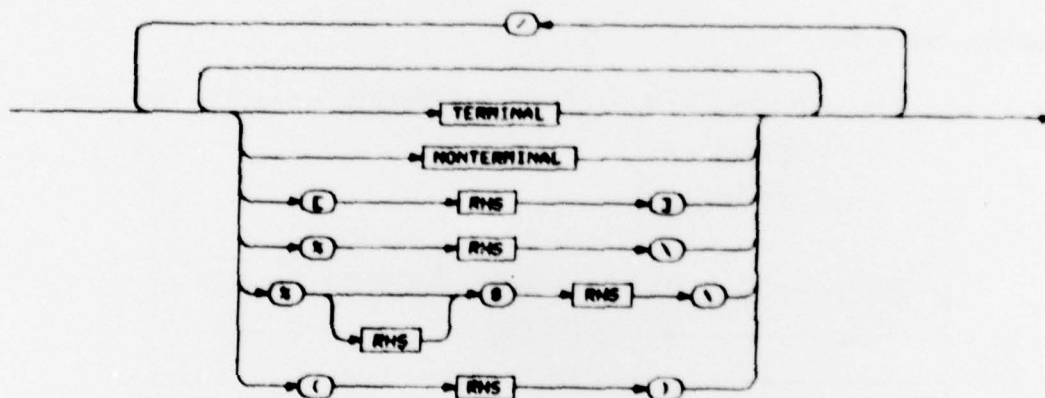[CHAR. STRING NOT CONTAINING DELIMITER] → [SAME DELIMITER]
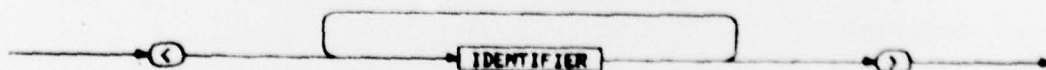
DELIMITER

[ANY PRINTING CHARACTER]
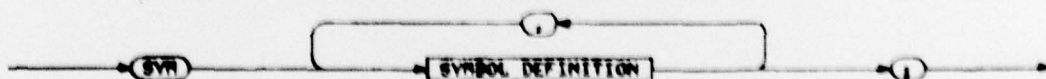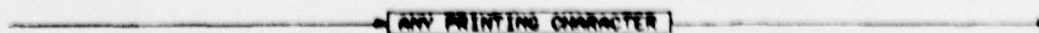
BNF SECTION

RHS
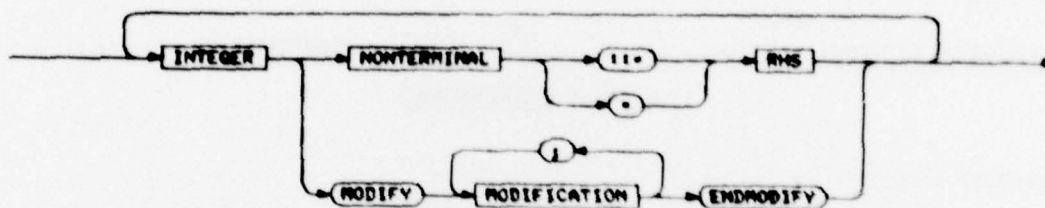
NONTERMINAL

TERMINAL

MODIFICATION
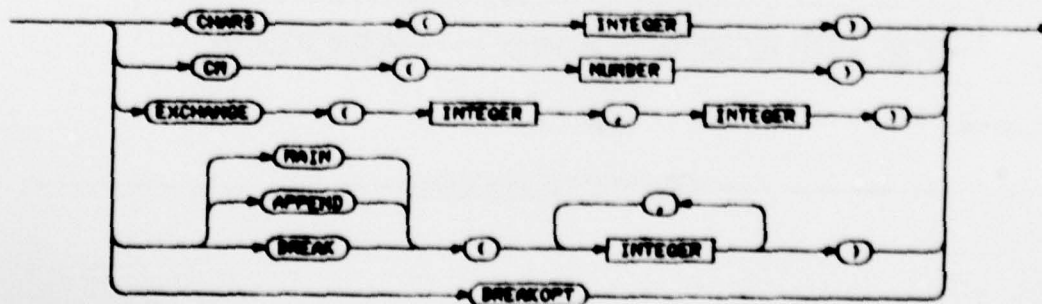
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Syndia, automatic syntax diagram generation, BNF, Backus-Naur Form, language documentation

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report describes how to use the Syndia/Syngra system available at SU-SCORE. This system accepts a BNF-like grammar specification and automatically generates the major component of this system; Syngra acts as an interface between Syndia and the SUDS2 graphics editor. Syndia performs no ambiguity or consistency checks on the BNF input.

This report assumes that the reader is familiar with BNF and syntax diagram representations of grammars.

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